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DESCRIPTION
OF A
FOSSIL PASSERINE BIRD
FROM THE
INSECT-BEARING SHALES OF COLORADO

BY

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ART. XIX.—DESCRIPTION OF A FOSSIL PASSERINE BIRD FROM THE INSECT-BEARING SHALES OF COLORADO.

By J. A. Allen.

Plate I.

The species described in the present paper is based on some beautifully preserved remains from the insect-bearing shales of Florissant, Colorado. They consist of the greater part of a skeleton, embracing all of the bones of the anterior and posterior extremities (excepting the femora). Unfortunately, the bill and the anterior portion of the head are wanting, but the outlines of the remainder of the head and of the neck are distinctly traceable. The bones are all *in situ*, and indicate beyond question a high ornithic type, probably referable to the Oscine division of the *Passeres*. The specimen bears also remarkably distinct impressions of the wings and tail, indicating not only the general form of these parts, but even the shafts and barbs of the feathers.

In size and in general proportions, the present species differs little from the Scarlet Tanager (*Pyranga rubra*) or the Cedar-bird (*Ampelis cedrorum*). The bones of the wings, as well as the wings themselves, indicate a similar alar development, but the tarsi and feet are rather smaller and weaker; and hence in this point the agreement is better with the short-legged Pewees (genus *Contopus*). These features indicate arboreal habits and well-developed powers of flight. The absence of the bill renders it impossible to assign the species to any particular family, but the fossil on the whole gives the impression of Fringilline affinities.

PALÆOSPIZA BELLA, *gen. et sp. nov.*

Wings rather long, pointed; tail (apparently*) about two-thirds the length of the wing, rounded or graduated, the outer feathers (as preserved) being much shorter than the inner. One side shows distinctly six rectrices. Tarsus short, its length a little less than that of the middle toe. Lateral toes subequal, scarcely shorter than the middle one. Hind toe about two-thirds as long as the middle toe. Feet and toes strictly those of a perching bird, and the proportionate length of the bones of the fore and hind limbs is the same as in ordinary arboreal *Passeres*, especially as represented by the *Tanagridæ*.

* The character of the tail must be given with reservation, since it is not quite certain that the whole of the tail, or that the exact form of the terminal portion, is shown, especially as the preserved impression is somewhat unsymmetrical.

One of the specimens affords the following measurements:—

	Inches.
Humerus, length	0.80
Forearm, length	0.95
Manus, length	1.02
Coracoid, length	0.72
Clavicle, length	0.63
Tibia, length	1.00
Tarsus, length	0.60
Middle toe and claw	0.65
Claw alone	0.20
Hind toe and claw	0.37
Claw alone	0.15
Wing	3.60
Tail (*approximate*)	2.70
Total length (approximate)	6.85

The bones still rest in the original matrix, and, being somewhat crushed and flattened, do not admit of detailed description and comparison with other types. The furculum is well preserved, and the limb-bones are all in place in their natural relation. The sternum is unrecognizable. The position of the cervical series of vertebræ and the general outline of the skull can be traced; but no structural characters of the head can be distinguished, except the proximal portion of the mandible. The long bones all present a well-marked longitudinal groove, due evidently to compression and fracture. This groove is distinctly traceable, even in such slender bones as tibiæ, tarsi, and clavicles. In point of size, while the furculum and the bones of the wing have all about the same length as the corresponding parts in *Ampelis cedrorum*, they apparently are considerably stouter. Their greater breadth may, however, be due simply to flattening from pressure. The tibiæ and tarsi are a little shorter than in the species last named, but the difference is only slight.

The most remarkable feature of the specimen is the definiteness of the feather impressions. Both the shafts and the barbs are shown with great distinctness in the rectrices, and the tips of the primaries of one wing are also sharply defined, overlying the edge of the partly expanded tail. The tip of the opposite wing can also be seen beneath the tail. The feet are so beautifully preserved that even the claws are perfectly distinct. (Plate I, fig. 1.)

Another specimen from the same locality, and probably representing the same species, consists of the tip of the tail and about the apical third of a half-expanded wing. (See Plate I, fig. 2.) In this example the tail is also pointed and graduated. About seven of the outer primaries of the wing are shown with great distinctness, and two others can be easily made out. The third primary is the longest; the second is slightly shorter; the first and fourth are about equal. There are also in the collection three detached contour feathers of small size, but whether pertaining to the same species as the other specimens cannot, of course, be determined.

FIG. 2.

FIG. 1.

Palæospiza bella, Allen.

The larger specimen, first described, is divided into an upper and a lower half, the greater part, however, adhering to the lower slab. The bones adhere about equally to the two faces. The drawing is made from the lower slab, with some of the details filled in from the upper one. The feather impressions are about equally distinct on both, and where in either case the bones are absent, exact molds of them remain, so that the structure can be seen and measurements taken almost equally well from either slab, except that nothing anterior to the breast is shown on the upper slab.

The species here described is of special interest as being the first fossil Passerine bird discovered in North America, although birds of this group have been known for many years from the Tertiary deposits of Europe. The highest extinct ornithic type hitherto known from America is a Picarian bird (*Uintornis lucaris*) related to the Woodpeckers, described by Prof. O. C. Marsh in 1872, from the Lower Tertiary of Wyoming Territory. Probably the insect-bearing shales of Colorado will afford, on further exploration, other types of the higher groups of birds.

For the opportunity of describing these interesting specimens I am indebted to Mr. S. H. Scudder, who obtained them during his last season's (1877) explorations of the Florissant insect-beds. The specimens are now the property of the Boston Society of Natural History. My thanks are due to Mr. J. H. Blake for the great care with which he has executed the drawings.

In conclusion, I may add that in 1871 I obtained a few distinct impressions of feathers from beds of the same age and from near the same locality. The first fossil feather, to my knowledge, discovered in North America was obtained by Dr. F. V. Hayden in 1869, from the fresh-water Tertiary deposits of Green River, Wyoming Territory. This was described by Professor O. C. Marsh in 1870,* who refers to it as "the distal portion of a large feather, with the shaft and vane in excellent preservation".

* Am. Journ. Sci. and Arts, 2d ser., vol. xi, 1870, p. 272.